

REMARKS

Claims 1, 3-9 and 11-27 are pending. No new matter has been added by way of the above amendments. For example, the subject matter of originally filed claim 2, now cancelled, has been added to independent claim 1. Throughout the claims the recitation of "general formula" has been replaced with simply "formula". New claim 17 is supported by originally filed claims 1, 9 and 10. New claims 18, 19, 20, 21, 22, 23, 24, 25, 26 and 27 are supported by the originally filed claims 3, 4, 5, 6, 7, 12, 13, 14, 15 and 16, respectively. Accordingly, no new matter has been added.

In view of the following remarks, applicants respectfully request that the Examiner withdraw all rejections and allow the currently pending claims.

Applicable 35 U.S.C. § 102(e) under AIPA

At page 2 of the outstanding Office Action the Examiner asserts that the changes made to 35 U.S.C. §102(e) by the American Inventors Protection Act (AIPA) do not apply to the present application. However, the Examiner has failed to note that the present application was filed on March 16, 2001. This date is after November 29, 2000; thus, this application should be examined under the Post-AIPA 35 U.S.C. §102(e) laws.

**Issues Under 35 U.S.C. §102(e)**

The Examiner has rejected claims 1, 3, 5, 9 and 14-16 under 35 U.S.C. §102(e) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Arai et al., USP 6,090,538 (hereinafter referred to as Arai '538). Applicants respectfully traverse.

In this rejection the Examiner has not rejected any of claims 2, 4, 6, 7, 8 or 10-13 over Arai '538. Applicants draw the Examiner's attention to the fact that independent claim 1 now recites the subject matter of originally filed claim 2. Accordingly, this rejection is moot. Reconsideration and withdrawal thereof are respectfully requested.

The Examiner has also rejected claim 12 under 35 U.S.C. § 103(a) as being obvious over Arai '538 in view of Asanuma. Applicants respectfully traverse. Claim 12 is dependent upon independent claim 1 which now recites the subject matter of originally filed claim 2. Accordingly, this rejection is also moot. Reconsideration and withdrawal thereof are respectfully requested.

The Examiner has also rejected claim 11 under 35 U.S.C. § 103(a) as being obvious over Arai '538 in view of Kato. Similar to above, applicants note that claim 11 ultimately depends upon independent claim 1, which now recites the subject matter of

originally filed claim 2. Accordingly, this rejection is moot. Reconsideration and withdrawal thereof is respectfully requested.

Lastly, the Examiner has rejected claims 2-8 under 35 U.S.C. § 103(a) as being obvious over Arai '538 in view of Takeuchi. Applicants respectfully traverse this rejection.

Distinctions Between the Present Invention and Arai '538

Arai '538 discloses a heat developable light-sensitive material comprising a bisphenol compound and a hydrazine compound. The Examiner appears to recognize that the hydrazine compounds of formula (1) set forth in the amended claim 1 (original claim 2) do not overlap with the hydrazine compounds of formula (I) of Arai '538. Thus, the Examiner utilizes Takeuchi '745 and states on page 4 of the Office Action that the use of the hydrazine of Takeuchi '745 in the material of Arai '538 would have been found *prima facie* obvious to one of ordinary skill in the art at the time the invention was made. Applicants disagree.

Takeuchi '745 is different from Arai '538 with respect to its technical field and accordingly no worker of ordinary skill in the art would be motivated to combine these two references. That is, Takeuchi '745 discloses a silver halide photographic light-sensitive material. Takeuchi '745 differs from Arai '538 in the silver source capable of reduction. Takeuchi '745 uses a silver halide and Arai '538 uses a silver salt of an organic acid as the

silver source. Please see column 43, lines 5-10 and column 42, lines 56-61 of Arai '538. Takeuchi '745 obtains a color image whereas Arai '538 obtains a black and white image.

The light-sensitive material of Takeuchi '745 is subjected to development with an alkaline processing solution. Please see column 67, lines 15-27 and column 78, lines 40-54. Arai '538 does not require solutions in the development process. Arai '538 simply heat an exposed material to form an image (heat development). Please see column 51, lines 61-67 of Arai '538.

Takeuchi '745 uses a dye-forming coupler of formula (II) in the silver halide light-sensitive material. It is well known in the art that couplers generate a colorant in development and react with an oxidized development agent to accelerate development reaction. Arai '538 does not use a coupler.

As noted above, there are several differences between Takeuchi '745 and Arai '538. Accordingly, no worker of ordinary skill in the art would be motivated to combine these two references. Regardless, even if a worker of ordinary skill in the art happened to combine these two references, he could not have reasonably predicted the characteristic features of the claimed invention.

The claimed invention provides a photothermographic material comprising the compound of formula (1) as a reducing agent for a silver salt of an organic acid. Various reducing agents for a silver salt of an organic acid (e.g. hindered phenol compounds and

bisphenol compounds) were known in the art before the claimed invention was made, but photothermographic materials comprising these reducing agents suffer from problems such as long development time and significant sensitivity fluctuation. It was also known that hydrazine compounds function as an ultrahigh contrast agent in photothermographic materials. When the conventional hydrazine compounds are added to a photothermographic material for medical use in a conventional amount, there may be problems such as strong fog, too high contrast, and low image reproductivity. Please see page 1, line 37 to page 4, line 8 of the present specification.

The present inventors have found for the first time that:

[A] the specific hydrazine compounds represented by formula (1) are capable of reducing a silver salt of an organic acid in the absence of a conventional reducing agent,

[B] the hydrazine compounds of formula (1) function as a reducing agent during a heat development in the absence of an alkaline processing solution without causing strong fog and too high contrast, and

[C] the use of a hydrazine compound of formula (1) and a bisphenol or hindered phenol compound in combination can improve sensitivity of the photothermographic material synergistically.

The above [A] and [B] are shown in Table 1 on page 109 and Table 2 on page 115 of the present specification. In particular, please note Samples 103-105 and 203-205 comprising no conventional

reducing agents wherein the claimed hydrazine compounds reduced silver ions to silver to form an image. These samples did not suffer from strong fog, too high contrast and low image reproductivity. This result indicates that the hydrazine compound did not function as an ultrahigh contrast agent.

The above [C] is also shown in Tables 1 and 2. In this regard, please see Samples 106-120 and 206-220.

With regard to [A] and [B], the Examiner's attention is directed to Table 8 on column 52, Table 9 on column 53, Table 10 on column 57 and Table 11 of Arai '538. These tables show that sensitivity and contrast ( $\gamma$ ) increase when conventional hydrazine compounds are incorporated in a photothermographic material comprising a reducing agent. This indicates that the hydrazine compounds of Arai '538 functions an ultrahigh contrast agent, which may cause strong fog and too high contrast.

Applicants submit that no worker of ordinary skill in the art would be motivated to select the specific hydrazine compounds of the amended claim 1 which had not been actually used in a photothermographic material, and incorporate the claimed compound in a photothermographic material in order to reduce a silver salt of an organic acid without causing the outstanding problems such as strong fog, too high contrast and low image reproductivity. Claims 1-16 are thus unobvious from Arai '538 and Takeuchi '745.

With regard to claims 17-27, the scope of formula (1) is not restricted. However, Applicants submit that the cited art fails to suggest or disclose the phrase "the amount of the compound represented by the formula (1) is 0.1-10 mole % of the amount of the compound represented by the formula (2) or (3)". Such a small amount of the hydrazine compound does not function as an ultrahigh contrast agent while excellent Dmax, fog and sensitivity can be obtained as shown in Tables 1 and 2 of the present specification.

In summary, no worker of ordinary skill in the art would be motivated to use the hydrazine compounds of claim 17 and the bisphenol or phenol compounds of claim 17 in combination in the claimed ratio to solve the outstanding problems such as strong fog, too high contrast and low image reproductivity. Claims 17-27 are thus patentable.

Accordingly, applicants respectfully submit that the Examiner has failed to present a valid *prima facie* case of obviousness. Accordingly, each of the outstanding rejections are overcome. Reconsideration and withdrawal thereof is respectfully requested.

If the Examiner has any questions or comments, please contact Craig A. McRobbie (Reg. No. 42,874) at the offices of BIRCH, STEWART, KOLASCH & BIRCH, LLP.

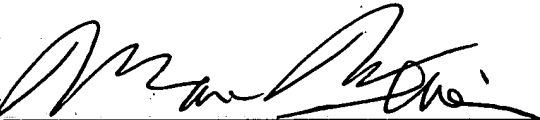
Attached hereto is a marked-up version of the changes made to the application by this Amendment.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant(s) respectfully petition(s) for a two (2) month extension of time for filing a reply in connection with the present application, and the required fee of \$\$400.00 is attached hereto.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made

(Rev. 02/20/02)



VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 2 and 10 have been canceled.

The claims have been amended as follows:

1. (Amended) A photothermographic material comprising [at least]
  - (e) a photosensitive silver halide,
  - (f) a reducible silver salt,
  - (g) a reducing compound represented by the following [general] formula (1), and
  - (h) a binder:

Formula (1):  $Q^1-NHNH-R^1$

wherein [, in the general formula (1),]  $Q^1$  represents a 5- to 7-membered unsaturated ring bonding to  $NHNH-R^1$  at a carbon atom, and  $R^1$  represents [a carbamoyl group, an acyl group, an alkoxycarbonyl group, an aryloxy carbonyl group, a sulfonyl group or a sulfamoyl group, provided that when  $R^1$  is propylcarbamoyl group,  $Q^1$  is not 2,3,5,6-tetrachloro-4-cyanophenyl group] a substituted carbamoyl group.

3. (Amended) The photothermographic material according to claim 1, wherein, in the compound represented by the [general] formula (1),  $Q^1$  represents a substituted phenyl group in which the sum of

Hammett  $\sigma$  p values of the substituents on the phenyl group is 1.6 or more.

4. (Amended) The photothermographic material according to claim 3, wherein, in the compound represented by the [general] formula (1),  $Q^1$  represents a substituted phenyl group in which the sum of Hammett  $\sigma$  p values of the substituents on the phenyl group is 1.6 or more,  $R^1$  is a substituted carbamoyl group represented by  $-C(=O)-NH-R^{11}$  and  $R^{11}$  is an alkyl or aryl group having 1-10 carbon atoms.

5. (Amended) The photothermographic material according to claim 1, wherein, in the compound represented by the [general] formula (1),  $Q^1$  represents a 5- to 7-membered unsaturated heteroring bonding to  $NHNH-R^1$  at a carbon atom.

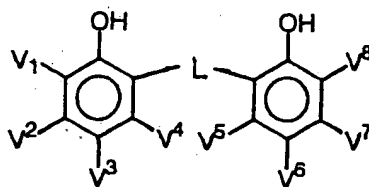
6. (Amended) The photothermographic material according to claim 5, wherein, in the compound represented by the [general] formula (1),  $Q^1$  represents a quinazoline ring bonding to  $NHNH-R^1$  at a carbon atom.

7. (Amended) The photothermographic material according to claim 6, wherein, in the compound represented by the [general] formula (1),  $Q^1$  represents a quinazoline ring bonding to  $NHNH-R^1$  at a carbon

atom,  $R^1$  is a substituted carbamoyl group represented by  $-C(=O)-NH-$   
 $R^{11}$  and  $R^{11}$  is an alkyl or aryl group having 1-10 carbon atoms.

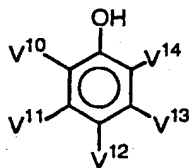
8. (Amended) The photothermographic material according to claim 1, wherein the compound represented by the [general] formula (1) does not function as an ultrahigh contrast agent.

9. (Amended) The photothermographic material according to Claim 1, which further contains (e) a compound represented by the [general] following formula (2) or (3) on the same surface of the support:



Formula (2):

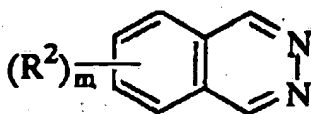
wherein [, in the general formula (2),]  $V^1$  to  $V^8$  each independently represent hydrogen atom or a substituent, and L represents a bridging group consisting of  $-CH(V^9)-$  or  $-S-$  where  $V^9$  represents hydrogen atom or a substituent:



Formula (3):

wherein [, in the general formula (3),]  $V^{10}$  to  $V^{14}$  each independently represent hydrogen atom or a substituent.

12. (Amended) The photothermographic material according to Claim 1, which further comprises (f) a compound represented by the [general] formula (4) on the same surface of the support:



Formula (4):

wherein, in the [general] formula (4),  $R^2$  represents hydrogen atom or a monovalent substituent,  $m$  represents an integer of 1 to 6 where  $(R^2)_m$  means that 1-6 of  $Y$  independently exist on the phthalazine ring, and when  $m$  is 2 or more, adjacent two of  $R^2$  may form an aliphatic ring or an aromatic ring.

13. (Amended) The photothermographic material according to Claim 12, wherein, in the [general] formula (4),  $R^2$  represents a monovalent substituent, and m represents an integer of 1 to 6.

Claims 17-27 have been added.